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CHILDREN'S HOSPITAL OAKLAND SCIENTIST FINDS POTENTIAL ALZHEIMER'S CURE IN CENTURY-OLD DRUG

*First study of its kind on a century-old drug could lead to new treatment
for Alzheimer's and Parkinson's*

August 13, 2008 – Oakland, Calif. – A new study conducted by researchers at Children's Hospital & Research Center Oakland shows that a century-old drug, methylene blue, may be able to slow or even cure Alzheimer's and Parkinson's disease. Used at a very low concentration – about the equivalent of a few raindrops in four Olympic-sized swimming pools of water - the drug slows cellular aging and enhances mitochondrial function, potentially allowing those with the diseases to live longer, healthier lives.

A paper on the methylene blue study, conducted by Hani Atamna, PhD, and his team at Children's, was published in the March 2008 issue of the *Federation of American Societies for Experimental Biology (FASEB) Journal*. Dr. Atamna's research found that methylene blue can prevent or slow the decline of mitochondrial function, specifically an important enzyme called complex IV. Because mitochondria are the principal suppliers of energy to all animal and human cells, their healthy function is critical.

“The results are very encouraging,” said Dr. Atamna. “We'd eventually like to try to prevent the physical and cognitive decline associated with aging, with a focus on people with Alzheimer's disease. One of the key aspects of Alzheimer's disease is mitochondrial dysfunction, specifically complex IV dysfunction, which methylene blue improves. Our findings indicate that methylene blue, by enhancing mitochondrial function, expands the mitochondrial reserve of the brain. Adequate mitochondrial reserve is essential for preventing age-related disorders such as Alzheimer's disease.”

Also impressed is one of Dr. Atamna's co-authors, Bruce Ames, PhD, a senior scientist at Children's and world-renowned expert in nutrition and aging “What we potentially have is a wonder drug.” said Dr. Ames. “To find that such a common and inexpensive drug can be used to increase and prolong the quality of life by treating such serious diseases is

truly exciting.”

Methylene blue, first discovered in 1891, is now used to treat methemoglobinemia, a blood disorder. But because high concentrations of methylene blue were known to damage the brain, no one thought to experiment with low concentrations. Also, drugs such as methylene blue do not easily reach the brain.

Dr. Atamna’s research is the first to show that low concentrations of the drug have the ability to slow cellular aging in cultured cells in the laboratory and in live mice. He believes methylene blue has the potential to become another commonplace low-cost treatment like aspirin, prescribed as a blood thinner for people with heart disorders.

Dr. Atamna’s research, funded by the Bruce and Giovanna Ames Foundation, was conducted at Children’s research institute and will continue when Dr. Atamna assumes a position as a professor of Neuroscience at The Commonwealth Medical College in Pennsylvania.

About Children’s Hospital & Research Center Oakland

Children’s Hospital & Research Center Oakland is Northern California’s only freestanding and independent children’s hospital. Children’s is the leader in many pediatric specialties including neonatology, cardiology, neurosurgery and intensive care. The hospital is a designated Level 1 pediatric trauma center and has the largest pediatric critical care facility in the region. Children’s Hospital has 190 licensed beds, 201 hospital-based physicians in 30 specialties, more than 2,611 employees and an operating budget of \$312 million. Children’s research arm, Children’s Hospital Oakland Research Institute, has about 300 staff members and an annual budget of more than \$49 million. Primary research funding comes from the National Institutes of Health. The institute is a leader in translational blood diseases, developing new vaccines for infectious diseases and discovering new treatment protocols for previously fatal or debilitating conditions such as cancers, sickle cell disease and thalassemia, diabetes, asthma, HIV/AIDS, pediatric obesity, nutritional deficiencies, birth defects, hemophilia and cystic fibrosis.